Citizen Science Projects (MOOC) 2.11

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Once you have defined which parameters you want to monitor, the next step is to prepare the actual data collection tools. This stage is essential to provide a structured way to collect robust data. Depending on who does the measuring and observing, these tools may vary. Tools can include manuals and guides for sensing (using sensors for data collection), as well as data recording sheets and journals. Tools for data recording can come in digital and non-digital forms, for example as smartphone apps, printable data recording sheets, or online forms.

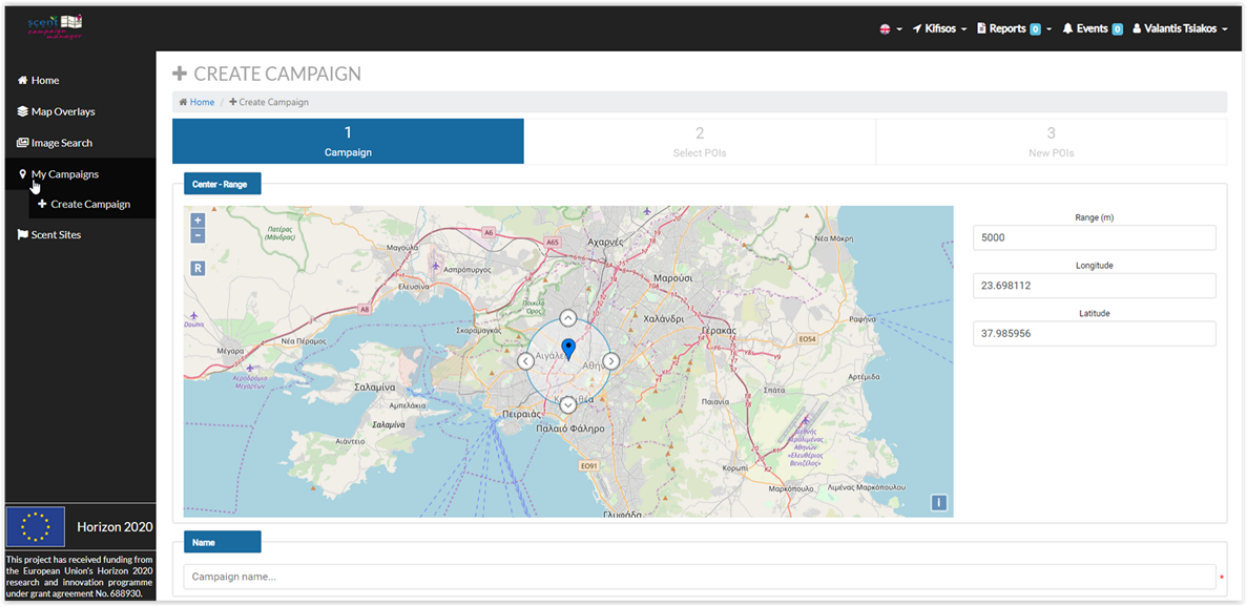
Think about the pros and cons of digital versus non-digital recording. Can you think of when you last recorded any data yourself? How did you do it?

##Formulation of the data collection needs

Once you have decided on the information that you need to capture, you'll need to decide how to train the citizen scientists you are working with, so that they can go ahead with data acquisition.

You may need to set a new platform for users to create new projects, modify existing ones, and view project data on a map that shows the locations of where observations were made, as well as observation data.

[Scent Campaign Manager](https://scent-project.eu/scent-toolbox) is an example. It allows policymakers and authorities to design citizen science campaigns. Users can define specific areas where data on land cover and land use, soil conditions and river parameters are needed.



##Manuals and guides for sensing and observing

If you work on a citizen science project with other people to measure and record data, sensing guidelines and manuals can support participants to provide regular, high-quality data. They usually include, at a minimum, the following:

+ A description of what to measure
+ A step-by-step guide of how to measure and record the data
+ An explanation of why measuring those parameters is important
+ Instructions on how to submit or upload the data

A manual can help participants follow an observational routine or a step-by-step process. Having manuals and guidelines makes it more likely that people will stick to agreed protocols because these resources will show them where to measure and what to pay attention to.

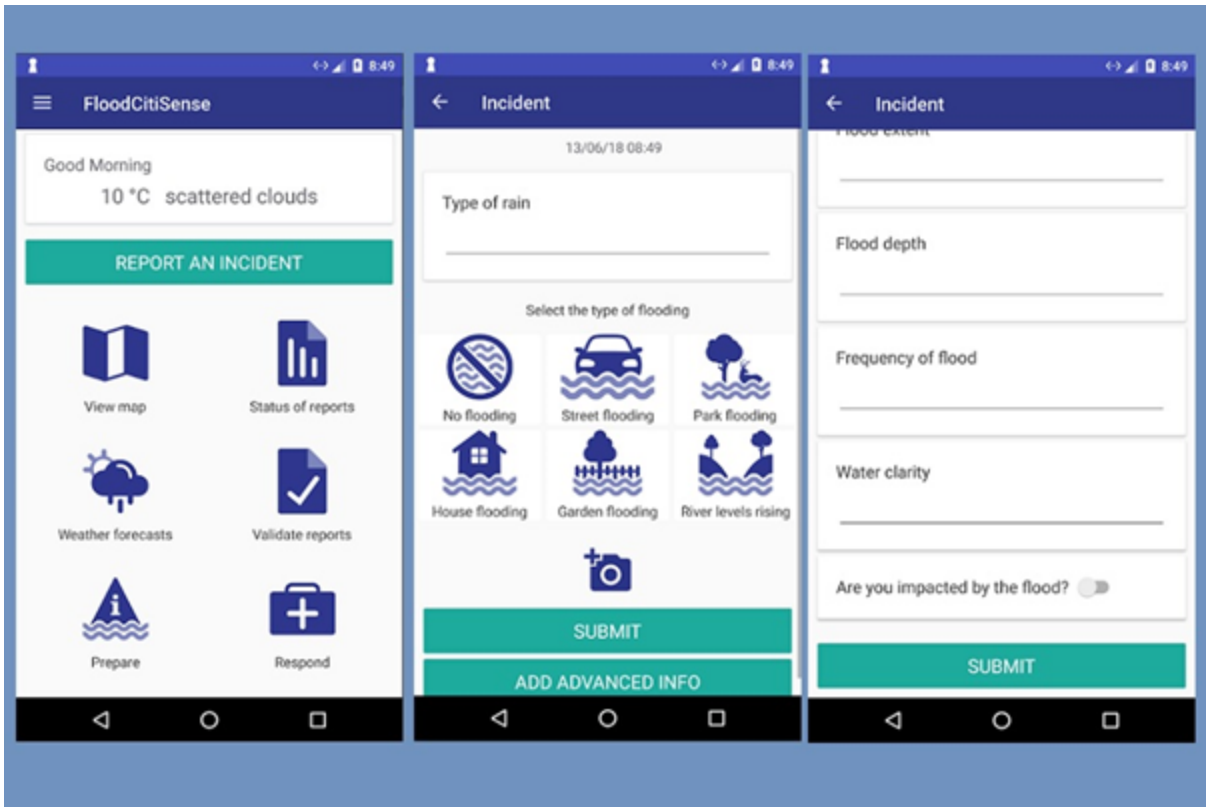
Guidelines can also help people make sense of the data they have recorded and put them in a larger context. If the community defines which parameters to measure, they should also draft the manual together. Doing this will make everyone aware of how important it is to have a structured approach. To see an example of a sensing manual, take a look at the [GROW Changing Climate Mission

Manual](https://knowledge.growobservatory.org/knowledge-base/sensing-manual-english-greek-hungarian/).

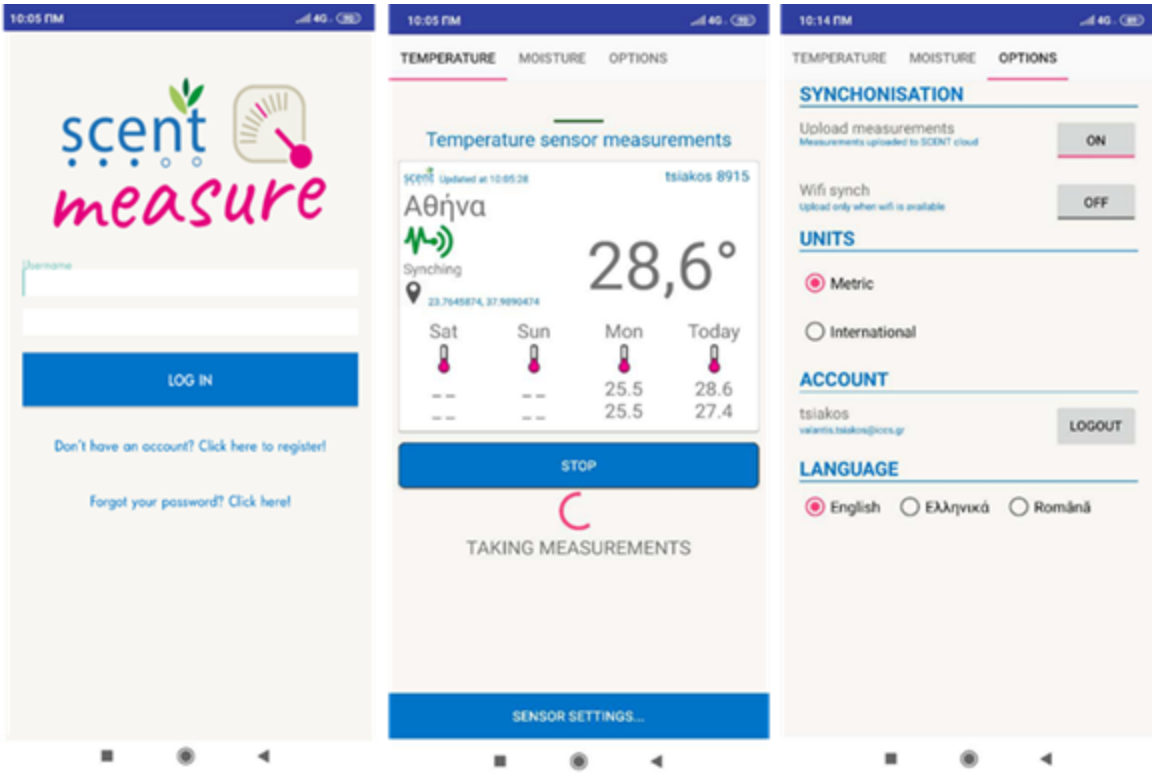
##Recording tools – Data sheets and journals

Sensing guides provide a structured process that you can follow. Data sheets and recording tools are where you record the actual observations and measurements. Data journals are extended versions of data sheets, where additional observations can be captured.

Here is a visual example of the [FloodCitiSense smartphone app](http://floodcitisense.eu); Citizens can use this tool to record the details of a flooding incident to support an early warning system for urban pluvial floods.



Another example can be found in the [SCENT Measure](https://scent-project.eu/scent-toolbox) application. Using portable sensors, this app measures and records the soil moisture and air temperature to the user's smartphone or tablet.



This is an example of the [collection sheet and data journal](https://knowledge.growobservatory.org/wp-content/uploads/2018/06/Harvest-Recording-Sheet.pdf) for crop yield data for an experiment from the [GROW Observatory](https://growobservatory.org/). The data are first recorded on a data sheet and then submitted digitally using an online form.

GROW OBSERVATORY

Recording sheet:
Polyculture v. Monoculture Experiment
3 – Harvests

GROW Living Soils Mission
2018-2019

Print this sheet and use it to record your observations in your growing site.

Full instructions for how to do each measurement can be found here:
https://knowledge.growobservatory.org/knowledge-base/how-to-set-up-the-experiment/

Location / name of experiment site (if more than one) _____

Your units of weight

Are you recording in

☐ Kilograms and/or grams (kg and g)

Harvest quantity

Weigh and record each harvest of each crop from both the polyculture and monoculture plots. It's good to keep scales and your recording sheets and pencil near to your plot to make this as easy as possible. You should weigh parts that you are going to eat (as if you bought them from the shop)

Beans – Weigh the pods before washing (stems removed).

Spinach – weigh the leaves. Shake off any dirt, but do **not** wash.

Radish – weigh either the roots or the pods. Leaves and stems should be removed, along with the root tip. Brush off dirt or rinse and pat dry.

Date (day/month)	**Crop** B – Beans S – Spinach Rr - Radish root Rp - Radish seed pod	**Plot** P – polyculture M – monoculture	**Weight** Mark your units above	**Quality** (0-5)	**Notes** e.g. weather, activity on plot, time spent on plot, pest/disease signs, plot differences, questions for the forum
eg 14/06 /2018	S	M	550 g	5	Dry and sunny all week. Spent 2 mins a day watering seedlings in each plot. Spinach in polyculture seems to be greener than that in monoculture.
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Which data recording and sensing tools are best for your project will largely depend on:
+ your resources
+ the purpose of your project
+ the data to collect
+ who analyses the data and their level of expertise
+ who should have access to the data

Some free open-source technologies are available for creating custom-made data collection tools, such as [OpenMapKit](http://openmapkit.org/), [GeoODK](http://geoodk.com/) or [EpiCollect5](https://five.epicollect.net/). You can also use other free of charge online services such as Google Forms and Sheets.

The Austrian Center for Citizen Science provides an overview of [helpful tools](https://www.zentrumfuercitizenscience.at/en/helpful-tools) to set up data recording citizen science projects.

WeObserve has a Toolkit with a selection of tools across four different categories:

+ Co-designing / co-creating your observatory

+ Training & data collection for environmental monitoring

+ Data quality and visualisation

+ Evaluation and advocacy

Select a tool. What do you think its advantages and disadvantages are?
Are you missing a tool you would like to see developed? Please share your thoughts below.